ULTRASONOGRAPHIC IMAGE OF UTERINE INVOLUTION IN POSTPARTUM SAHIWAL COWS

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ABSTRACT

A total of 24 Sahiwal cows with normal parturition were selected and randomly divided into primiparous (n= 12) and pluriparous (n=12 groups) which were further sub divided based on Body Condition Score (BCS) 2-3 (n = 6) and BCS 3-4 (n=6) for monitoring uterine involution during postpartum period. The uterine involution was monitored by measuring diameter of Previous Gravid Uterine Horn (PGUH), Previous Non-Gravid Uterine Horn (NPGUH) and Cervix using Ultrasonographic images from day 14 to 44 postpartum at six days interval. The diameter (mm) of previous gravid uterine horn (PGUH) on day 14, 20, 26, 32, 38 and 44 postpartum was 33.9 ± 2.36, 30.81 ± 2.14, 28.205 ± 2.03, 25.49 ± 1.82, 23.93 ± 1.7 and 21.91 ± 1.51 respectively. The diameter (mm) of previous non-gravid uterine horn (NPGUH) on day 14,20,26, 32, 38 and 44 postpartum was 6.35 ± 1.19, 5.49 ± 1.17, 5.2 ± 0.97, 4.79 ± 0.94, 4.13 ± 0.96 and 3.72 ± 0.78 respectively There was significant effect of parity on diameter of previous gravid uterine horn (PGUH) and previous non-gravid uterine horn (NPGUH) from day 14 to day 44 postpartum. There was no significant effect of body condition score on uterine involution of both previous gravid uterine horn (PGUH) and previous non-gravid uterine horn (NPGUH). The diameter (mm) of cervix on day 14,20,26, 32, 38 and 44 postpartum was 47.11±2.29, 43.8 ± 2.41, 40.53 ± 1.90, 37.78 ± 1.63, 35.61 ± 1.34 and 33.34 ± 1.17 respectively. There was significant effect of parity on diameter of cervix from day 14 to day 44 postpartum.

Key words: Body Condition Score, Parity, Primiparous, Pluriparous, Uterine horn

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Among the indigenous breeds Sahiwal is known to be the best milch breed in India and had shown an excellent adoptability to the agro climatic condition of Chhattisgarh state, with a milk production potential of 2270 litres during lactation.After parturition the uterus is large flabby sac, thus reduction in size and reorganization of tissue are necessary before another pregnancy can be maintained (Wael, 2013). There is paucity of literature on uterine involution effect of body condition score and parity on uterine involution during postpartum period in Sahiwal cows.Therefore the present study was degined to study the uterine involution and effect of body condition score and parity on uterine involution in Sahiwal cows.

A total of 24 Sahiwal cows with normal parturition were selected and randomly divided into primiparous (n= 12) and pluriparous (n=12 groups) which were further sub divided based on BCS 2-3 (n=6) and BCS 3-4 (n=6) for monitoring uterine involution during postpartum period. The uterine involution was monitored by measuring the variation of the transverse luminal diameter of the uterine horn in ultrrasonographic image (ProsoundALOKA,Scanner MHz transrectal probe) from days 14 to 44 postpartum at 6 days interval. The ultrasonographic equipment with image freeze and electronic calliper functions were used for taking measurements. The obtained data were analysed using student't' test as described by Snedecor and Cochran (1984)

The overall diameter (mm) of previous gravid uterine horn (PGUH) was 33.9 ± 2.36, 30.81 ±2.14,

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28.205 ±2.03, 25.49 ± 1.82, 23.93 ± 1.7 and 21.91 ± 1.51 on day 14,20,26, 32, 38 and 44 respectively. Significant reduction in diameter (mm) of previous gravid uterine horn (PGUH) and non-gravid uterine horn (NPGUH) from day 14 to day 44 was recorded.

The overall diameter (mm) of cervix was 47.11±2.29, 43.8 ± 2.41, 40.53 ± 1.90, 37.78 ± 1.63, 35.61 ± 1.34 and 33.34 ± 1.17on day 14, 20, 26, 32, 38 and 44 respectively. There was gradual reduction in diameter of cervix from 14 to 44 day of postpartum. There was significant lower diameter of cervix on day 44 than day 14 postpartum (33.34 ± 1.17 vs 47.11±2.29 $P<0.05$).

Significant reduction in diameter of previous gravid uterine horn (PGUH) in primiparousSahiwal cows on day 14,32,38 and 44 than in pluriparous cows Significant reduction in diameter was recorded on day 38 and 44 in primiparous than pluriparous animals in non-gravid uterine horn (NPGUH) while there was no significant difference in diameter of non-gravid uterine horn (NPGUH) on day 14,20,26 and 32 postpartum. There was significant reduction of cervical diameter on day 44 in primiparous than pluriparousSahiwal cows while there was no significant effect of parity on cervical diameter on day 14,20,26, 32 and 38 of postpartum.

Significant reduction in diameter of previous gravid uterine Horn (PGUH) in primiparousSahiwal cows with Body Condition Score (BCS) of 2-3 than 3-4 from days 14 to 44 of postpartum. There was no significant effect on diameter of Previous Gravid Uterine Horn (PGUH) in pluriparousSahiwal cows with body condition score 2-3 and 3-4 from days 14 to 44 of postpartum. There was no significant effect on Previous Non - Gravid Uterine Horn (NPGUH) in primiparous andpluriparousSahiwal cows with body condition score of 2-3 and 3-4 from days 14 to 44 of postpartum. There was no significant effect in cervical diameter inprimiparous and pluriparousSahiwal cows with body condition score 2-3 and 3-4 from days 14 to 44 of postpartum.

The present study corroborated with those of Wehrend *et al.* (2003) who reported that the uterine involution is associated with a progressive decrease in vaginal discharge and in uterine and cervical diameters. The cervix decreases from approximately 30 cm immediately after parturition to approximately 2 cm by Day seven postpartum. Cervical width is regarded as a good indicator of the progression of uterine involution particularly in the first three weeks postpartum as the uterus is difficult to palpate during this period. The cervix contracts between Days five and ten, then relaxes back to its prepartum state.

Kasimanikam *et. al.* (2004) reported that uterine involution is associated with a progressive decrease in vaginal discharge and in uterine and cervical diameters. The larger the diameter of the cervix after partition, the longer the time taken for involution to occur.LeBlanc *et al.* (2002) reported that the decrease in the uterine diameter follows a similar pattern to the cervical diameter though the cervix normally involutes more slowly than the uterus. Cervical width is a better predictor of reproductive problems than uterine size as there is less variation in the size and accessibility of the cervix during involution. The optimum time to assess cervical involution is three weeks postpartum and the optimal threshold to assess is between 6 and 7.5 cm. By Day 40, healthy cows have a diameter of less than 5 cm even though involution may not be complete for another ten days. Harrison *et al.* (1990) found that there is no association between uterine involution and milk production. There were no significant differences between cows with high or average milk production in the interval from parturition to uterine involution, and days to first ovulation between cows with high or average milk production. Heppelmann *et al.* (2013) reported that frequent examinations during the first 2 weeks post-partum revealed a characteristic decrease in uterine blood flow in healthyprimiparous cows. Morrow *et al.*, (1969) reported that the number of lactations influences the cervical and uterine involution. Multiparae cows (≥6) have a prolonged involution, which may be explained by the increased uterine size in these animals.

Oltenacu *et al.* (1983) observed that cervical involution involves the restoration of the cervix to its prepartum state. Cervical involution is affected by parity and postpartum discharge. Cervical width is regarded as a good indicator of the progression of uterine involution particularly in the first three weeks postpartum as the uterus is difficult to palpate during this period.

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